

STANDARD SPECIFICATIONS
& CONSTRUCTION DETAILS MANUAL

SECTION 6 – WATER

6.01 Preliminary Considerations

All water main extensions and distribution facilities shall be in accordance with the City of Raleigh standards.

6.02 Design

a. Fire Hydrants:

- (1) Residential Zoning Districts - Fire hydrants shall be located at each street intersection. The maximum distance between fire hydrants in residential districts, measured along street centerlines, shall not exceed 500 feet. On group housing projects, all parts of the buildings shall be within 300 feet of a fire hydrant.
- (2) Business, Commercial, Industrial Zoning Districts - There shall be at least one fire hydrant located at each intersection. The maximum distance between fire hydrants in these districts, measuring along street centerlines, shall be 300 feet. All parts of each building shall be within 500 feet of hose run from a fire hydrant. Hose run lengths shall be measured along a route not closer than 20 feet from the building(s). All fire hydrants shall have full vehicular access via durable surface and shall not be located within 30 feet of a structure. Fire hydrant locations shall be coordinated with the Engineer, the Knightdale Fire Department and the Wake County Fire Marshal.
- (3) Main Size - Water mains supplying fire hydrants shall be 6" or larger. Only one (1) fire hydrant may be fed from a single feed (or dead end) 6" water main.

b. Valves:

Valves shall be installed on all on hydrant branches.

6.03 Trench Excavation & Preparation

a. General Requirements:

The pipeline trench shall be excavated to the line and gradient shown on the approved drawings. The length of trench which may be open ahead of pipe laying operations shall be no more than 100 feet and no less than 20 feet unless warranted by special circumstances, and then only upon approval of the Town Representative.

6.04 Materials

a. Hydrants:

Fire hydrants shall be of the compression type meeting AWWA C502-80 standards, designed for a minimum working pressure of 150 psi and a hydrostatic test pressure of 300 psi with the valve in both the open and closed positions.

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All hydrants shall be equipped with two 2½-inch nozzles and one 4-inch pumper nozzle. Each nozzle shall be bronze with cast iron caps secured thereto with a suitable steel chain. Nozzles shall have National Standard threads.

The hydrants shall be open-left and equipped with a pentagon-type operating nut (National Standard) measuring 1½ inches from point to flat. Hydrants shall be of the "dry top" type with the upper rod threads completely enclosed in a sealed grease or oil chamber, equipped with "O" ring seals and a Teflon thrust bearing.

The hydrant valve opening shall be of sufficient size to insure such flows and corresponding minimum losses as set forth by the American Water Works Association. The minimum valve opening shall be 4½ inches.

The hydrants shall have a 6-inch shoe or boot, mechanical joint. Hydrants shall have bronze to bronze threads provided between the hydrant seat or seat ring and the seat attaching assembly. The hydrant shall be of the "safety" type so that, if the upper barrel is broken off, the hydrant valve will remain closed and reasonably tight. All hydrants shall be furnished with barrel and stem extensions as required by the final field location to provide a nominal minimum bury of three feet, six inches (3'-6"), or greater, if indicated on the Drawings.

Hydrants shall be Mueller Centurion, American Mark 73, Clow Medallion or Kennedy Guardian.

6.05 Installation of Water Mains, Fittings, Valves & Appurtenances

a. Setting Hydrants:

Fire hydrants shall be installed at all points indicated on the drawings and in strict accordance with the standard detail. Hydrants shall be set plumb with the steamer nozzle facing the street. The area surrounding the hydrant shall be generally flat and clear for a distance of 3 feet in each direction of the hydrant. The traffic flange shall be 2" above the finish grade. New hydrants shall be factory or field painted to match existing Town hydrants. Hydrants shall be lubricated upon completion of installation.

6.06 Installation of Steel Casing Pipes by Boring & Jacking

Steel casing pipe to be installed by simultaneous boring and jacking shall be constructed to meet required standards of NCDOT. For railroad crossings, the construction requirements shall conform to the requirements of the affected railway company.

The project drawings shall show a plan and profile for each casing pipe to be installed. The plan shall clearly note the casing pipe wall thickness and length. For railroad crossings, the Contractor shall be certain that a proper license agreement has been obtained and that any special insurance requirements are compliant.

6.07 Cutting & Replacement of Existing Pavements

Open-cut of existing bituminous pavement is generally not permitted on Town streets, designated State maintained roads, and on private driveways. Site-specific cases may be considered by the

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Town. Where bituminous pavements are open-cut, the pavement shall be restored with pavement replacement conforming to the detail shown on the approved drawings.

Open-cut of concrete pavement may also be permitted where required at existing private driveways. Concrete pavement shall be restored with pavement replacement conforming to the standard detail and to the complete satisfaction of the affected property owner.

The pavement shall be cut to true neat lines, with cutting equipment as may be approved by the Town Representative, and in such a manner as not to damage the pavement outside the cutting line. The cut pavement shall then be broken up as necessary and then hauled away before trench excavation is begun to prevent its being mixed with excavated material which would be used for backfill. The edge of the pavement cut shall be at least 12 inches beyond the edge of the trench line.

Specifications previously presented relative to excavation, bedding, and backfilling shall apply with special care taken to ensure that backfill material is of select quality, and is placed and compacted in shallow 6-inch lifts.

After completion of the trenching and pipe laying operations, the backfill shall be brought to the required subgrade depth, from which point, the remaining depth (8" - 12") shall be backfilled with Aggregate Base Course, compacted in two lifts. The base course shall remain for a minimum of four (4) days prior to placement of paving, so as to allow for further natural settlement which may result from normal traffic. When final settlement is obtained, a portion of the ABC shall be removed as required to accommodate the final pavement section. All materials and pavement placement methods shall be in strict accordance with the requirement of NCDOT - *Standard Specifications for Roads & Structures*, latest edition.

NOTE: Type I 19.0B intermediate course shall be used in lieu of ABC, if required by the NCDOT.

6.08 Water Use During Construction

The Contractor shall make arrangements with the City of Raleigh Representative for water to be used in the filling, testing, flushing, etc. of newly installed water mains. All work requiring water shall be carried out in a manner, which will minimize the volume of water required. Water for construction activities other than those associated with new public water mains shall be purchased from the City of Raleigh or supplied by the Contractor. Contact the City of Raleigh Public Works Department for information on purchasing water.